Glossary for Digital Orthoimagery

Aerial Photography

Aerial photography is any photography taken from the air. Typically, aerial photographs are taken with specialized, high-quality, large format cameras that point down vertically from the aircraft to the ground below. Orthophotography is derived from overlapping vertical aerial photography. Digital cameras are becoming more prevalent than film cameras for projects in North Carolina.

Color Infrared (CIR)

A "false color" film type which senses information in the green, red, and near-infrared portions of the spectrum. On CIR imagery, near-infrared will appear as red; red will show as green; and green as blue. Blue is not detected. Commonly used for vegetative mapping, natural resource assessment, and environmental analysis. CIR depicts health of vegetation, soil moisture, and other environmental factors as well as impervious surfaces.

Digital Orthoimagery (DOI)

Digital Orthoimagery is a remotely-sensed digital picture, stored in a raster data format. It is a geo-referenced image prepared from a vertical photograph or other remotely-sensed data in which displacement of objects due to sensor orientation and terrain relief have been removed.

Digital Terrain Model (DTM)

Digital Terrain Model is a sample of terrain elevations points used to model a land surface. It is a required element in the processing of digital orthoimagery based on the accurate identification of control points in the images whose ground positions are accurately known. North Carolina has statewide elevation datasets derived from Light Detection and Radar (LIDAR) technology.

Geographic Registration

The spatial referencing of an orthoimage to an area on the earth's surface. An image must be geographically registered in order to use it in a GIS as an overlay.

Global Positioning System (GPS)

A system of satellites, computers, and receivers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.

Ground Control Point

Points of accurately known geographic location used to register imagery and other coverage data to ground position.

Ground Sample Distance (GSD)

The area on the ground represented by each pixel in a digital orthoimage. The smaller the pixel, the more detail visible in the image. North Carolina requires pixel of one-foot or smaller, and 6-inch and even 3-inch pixels are prevalent over urban areas.

High Accuracy Reference Network (HARN)

The HARN is a statewide network of survey monuments measured to an extremely high level of accuracy with respect to, and as part of, a similar nationwide network of high-accuracy points. The positions of these monuments are established using Global Positioning System (GPS) and other sophisticated space-based measuring technologies. The purpose of basing the geographic positioning of the Statewide Digital Orthoimagery Program on the HARN is to ensure uniform and accurate ties of the orthoimagery to the

physical world, and to ensure compatibility with other data sets tied to the national network.

Metadata

Information about the content, quality, condition, and other characteristics of data.

Multi-spectral

Digital orthoimagery collected in multiple bands, with each band corresponding to a portion of the spectrum. Various band combinations may be combined to assist in the identification of specific ground features, via automated image processing techniques.

Natural Color

A film type which senses the same portion of the spectrum as human vision. Commonly used for inventory analysis, cartographic verification, and data verification. Especially useful for showing man-made features, which typically occur in a wider range of colors than natural features.

Panchromatic

A film type which renders imagery as gray scale. It generally provides the best resolution and least amount of storage space.

Pixel

Two-dimensional picture element that is the smallest non-divisible element of a digital image.

Positional Accuracy

This refers to the variation that can exist between coordinates for a feature on the image to the actual location of that feature on the earth's surface.

Remote Sensing

The process of collecting data about objects or landscape features without coming into direct physical contact with them.

Scale

The ratio of distances on a map to those same distances on the earth's surface. Ground resolution relates to mapping scale. For example, a map scale of 1 inch on the map = 200 feet on the ground is equivalent to an image ground resolution of 6 inches (pixel size). A scale of 1-to-400 is equivalent to 1-foot resolution. A scale of 1-to-100 is equivalent to 3-inch ground resolution.

State Plane

A coordinate system (grid) of plane rectangular (x, y) coordinates for pre-determined zones in each of the 50 states. Local governments in North Carolina use state plane with map units in feet.

Tiling

Images are subdivided into smaller units to reduce the physical file size and the amount of computer processing required. Tiles usually cover a regular rectangular grid. The tile size for 6-inch resolution images in North Carolina is 5,000 feet by 5,000 feet.

Source: NC Center for Geographic Information and Analysis, adapted from New York State Geographic Information System Clearinghouse, the Federal Geographic Data Committee glossary, and various project documents.